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# United States Patent [19]

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[54] CODE CONVERSION METHOD AND APPARATUS, CODE RECORDING MEDIUM, CODE RECORDING APPARATUS AND CODE REPRODUCING APPARATUS

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[52] U.S. Cl. .... 341/58; 341/59; 360/39

[58] Field of Search ..... 341/58, 59, 94, 341/95; 360/48, 39, 32; 369/44, 38

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## [57] ABSTRACT

A code conversion method and apparatus is provided for scrambling and modulating data. The method and apparatus includes scrambling an input main data unit based on any of plural types of pseudo-random number sequences, and modulating the scrambled main data unit based on any of plural types of modulation data. An output main data unit is produced from the modulated main data unit, and a calculated value representing a difference between a number of 0 bits and a number of 1 bits included in the output main data unit is obtained. Any of the modulation data is then selected dependent upon the calculated value. The method and apparatus further includes determining whether or not a variation of the calculated value has exceeded a predetermined threshold, newly selecting another pseudo-random number sequence used for the step of scrambling if it is determined that the variation of the calculated value has exceeded the predetermined threshold value, and re-scrambling the input main data unit based on the newly selected pseudo-random number sequence.

36 Claims, 24 Drawing Sheets

